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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/160,583	09/25/1998	TAKAKO KAMO	0050-1545-0	6527

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1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 09/23/2003

32

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/160,583

Applicant(s)

KAMO, TAKAKO

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-27 is/are pending in the application.
- 4a) Of the above claim(s) 6-18 and 20 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-5, 19 and 21-25 is/are allowed.
- 6) ☒ Claim(s) 26 and 27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on July 2, 2003 and August 19, 2003 have been entered.

This Office action addresses claims 2-24 and newly added claims 25-27. Claims 6-18 and 20 remain withdrawn from consideration. Claims 2-5, 19, and 21-25 are allowed. Claims 26 and 27 are newly rejected under 35 USC §102. This action is non-final.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 26 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Kawakami et al (U.S. Patent 5,702,845). Regarding claims 26 and 27, the reference teaches a secondary battery with a nonaqueous electrolytic solution in column 9, lines 39-60. In column 7, lines 44-60, the reference further teaches a positive electrode active material comprising a transition metal sulfide which may comprise copper, silver, or gold. As disclosed in the Examples, the positive active material may be present in an amount of 92 % by weight of the positive electrode. Although the reference does not expressly teach that Cu, Ag, or Au is present in a range of 0.4 to 5 per unit of sulfur as recited in claims 26 and 27, the reference is considered to be anticipatory of this formula because the artisan would at once be able to envisage species of sulfides falling within the claimed subscript range. See MPEP §2131.02. Regarding the limitation that the sulfide material is contained the negative electrode, the positive electrode of Kawakami et al. would inherently function as a negative electrode upon charging of the battery. Regarding the limitation that the sulfide material is operable in the range of 0-1.5V with respect to the oxidation-reduction potential of lithium, this limitation is also inherent in the reference. The potential difference generated between the claimed sulfide and a lithium counterelectrode is an inherent property of the sulfide, just as all electrode material pairs have an inherent potential difference between them. The magnitude of the potential difference is highest when the battery is in a fully charged state and subsequently approaches 0V as the battery is discharged.

Thus, the instant claims are anticipated.

Response to Arguments/Declaration

4. Applicant's arguments filed July 2 and August 19, 2003 have been fully considered, but are not persuasive insofar as they apply to the present rejection. Applicants state that in Example 1 of the Kawakami patent, the cell is operated between 4.5V and 2.5V. However, the cell in Example 1 of Kawakami contains aluminum as a negative electrode and lithium manganese oxide as a positive electrode. The cell does not contain a sulfide, as required by the instant claims. The cell also does not contain lithium metal, which is recited in relation to the operating voltage of the claimed sulfide material. As the example cell of Kawakami does not contain either of these materials, it is believed that comparison made by Applicants of the claimed cell to the cell of Kawakami is not germane. Further, as set forth above, the sulfide of Kawakami would inherently operate between 0 and 1.5 V with respect to lithium. Accordingly, this limitation is not considered to distinguish claims 26 and 27 over the Kawakami reference.

Further, the declaration filed on July 2, 2003 is also not persuasive in distinguishing the claims over the Kawakami reference. The declaration states that "a coin-shaped cell was produced in the same manner as in Example 2 [of the present specification] by use of MnS as an active material of a negative electrode. The coin-shaped cell produced was completely inoperable. This test result indicates that a battery having MnS as an active material of a negative electrode is inoperable. Thus, all the sulfide materials of Kawakami et al. do not function as a negative electrode and the materials used for positive and negative electrode in the patent are not always interchangeable." In response, it is maintained that Applicants' statements in the declaration are not persuasive in distinguishing Cu, Ag, and Au over the other metals

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disclosed by Kawakami. It is unclear in which way(s) Applicant's comparative cell employing MnS is "inoperable," as no actual data or results are shown. Furthermore, this showing does not address any other "comparative" metals disclosed by Kawakami (e.g., Sc, Y, Ti, Zn, Hf, V, Nb, etc), or copper and gold, which are within the scope of the present claims and which are "desirably" used as the sulfide in Kawakami et al. Therefore, it is believed that there is still not enough data on the record to support a conclusion that sulfides of silver, copper, and gold perform unexpectedly better than the sulfides of other metals disclosed by Kawakami et al.

Allowable Subject Matter

5. Claims 2-5, 19, and 21-25 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter:

Independent claims 19 and 21 are directed to a secondary battery (claim 21) and an energy storage device (claim 19) comprising a nonaqueous electrolyte solution and a negative electrode which releases electrons upon discharge and comprises a metal sulfide in a weight percentage of 75-99.9%. Kawakami discloses relevant sulfide materials for use in a positive electrode (see col. 7, line 44 et seq.). However, this electrode would not release electrons upon being discharged, as recited in claims 19 and 21 (it would *accept* electrons). Therefore, claims 19 and 21 patentably distinguish over Kawakami. Additionally, Plichta et al (U.S. Patent 5,154,990) teach a CuS negative electrode material in column 3, line 12. However, the reference teaches solid electrolytes (see abstract). It would not be obvious to replace the solid electrolyte

of Plichta with a liquid electrolyte, as required by the instant claims, because Plichta teaches in column 3, line 3 that "[i]n the lithium-organic solvent electrolytes there are strongly solvated ionic species that tend to irreversibly cointercalate into the electrode lattice structure resulting in significant capacity losses. Since the solid state cell operates only through the diffusion of lithium ions, this effect is not present." Accordingly, claims 19 and 21 are also distinguished over Plichta et al.

Conclusion

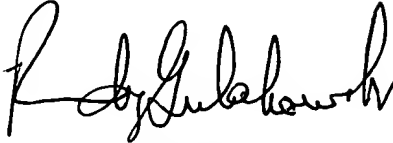
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (703) 308-4333. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 872-9310 (for non-final communications) or (703) 872-9311 (for after-final communications).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

September 15, 2003


RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700